REMARKS/ARGUMENTS

The present Amendment is in response to the Office Action having a mailing date of November 20, 2006. Claims 1-40 are pending in the present Application. Applicant has amended claims 1, 2, 8, 9, 13, 14, and 30-38. Applicant has also canceled claims 15-29. Consequently, claims 1-14 and 30-40 remain pending in the present Application.

Applicant has amended claims 1 and 14 to recite that the stress-assist layer(s) do not exert stress(es) on the magnetic element(s) when the magnetic element(s) are in a quiescent state. Support for the amendment may be found in the specification, page 13, lines 21-23. Applicant has amended claims 2, 8, 9, 13, and 30-38 to be in independent form, incorporating the limitations of the base claim and any intervening claims. Accordingly, Applicant respectfully submits that no new matter is added.

In the above-identified Office Action, the Examiner indicated that claims 2, 8-10, 13, and 30-38 would be allowable if rewritten or amended to be in independent form.

Applicant welcomes the Examiner's indication that claims 2, 8-10, 13, and 30-38 contain allowable subject matter. Applicant has amended claims 2, 8, 9, 13, and 30-38 to be in independent form, incorporating the limitations of the base claim and any intervening claims. Accordingly, Applicant respectfully submits that claims 2, 8-10, 13, and 30-38 are allowable as currently presented.

In the above-identified Office Action, the Examiner rejected claims 1, 3-7, 11, and 12 under 35 U.S.C. § 102 as being anticipated by U.S. Patent Application Publication No. 2004/0145850 (Fukumoto). In so doing, the Examiner cited the "Description of the Related Art" and "Summary of the Invention" sections.

Applicant respectfully traverses the Examiner's rejection. Claim 1 recites a magnetic memory that includes a plurality of magnetic elements and at least one stress-

assist layer. Each of the plurality of magnetic elements is configured to be written using spin transfer. The stress-assist layer(s) are configured to exert at least one stress on at least one magnetic element of the plurality of magnetic elements during writing and not when the at least one magnetic element is in a quiescent state. The magnetic element is in a quiescent state when no current is driven through the magnetic element. Specification, page 13, line 21-page 14, line 7. Because the stress is exerted during writing but not in the quiescent state, a transient anisotropy is introduced during writing. This transient anisotropy may reduce the current required to write to the magnetic element(s) but not adversely affect the thermal stability of the magnetic element(s). Specification, page 13, line 21-page 14, line 8.

Fukumoto fails to teach or suggest a magnetic memory including magnetic elements configured to be written using spin transfer in conjunction with stress-assist layer(s) that are configured to exert stress(es) on magnetic element(s) during writing but not when the magnetic element(s) are quiescent. Although the Examiner has indicated that spin transfer is described in the "Description of the Related Art" section of Fukumoto, Applicant's reading of the cited section finds no mention of spin transfer. As discussed in the present application, spin transfer allows a magnetic element to be *written* using a write current driven through the magnetic element. Specification, page 23, line 10-page 24, line 4 and page 12, line 13-page 14, line 6. Not only can Applicant find no mention in Fukumoto of spin transfer, but Applicant also finds no mention in the cited portions of Fukumoto of writing to the magnetic element using a current. Consequently, Fukumoto fails to teach or suggest the use magnetic element(s) that are configured to be written using spin transfer.

Furthermore, Fukumoto fails to teach or suggest the use of stress-assist layer(s) that are configured to exert stress(es) on magnetic element(s) during writing but not when the magnetic element(s) are quiescent. Because the magnetic elements are configured to be written using spin transfer, the magnetic elements are written at least by driving a write current through the magnetic elements. Specification, page 12, line 13-page 14, line 6. Thus, the stress-assist layer(s) are configured to exert stress(es) on the magnetic element(s) when a write current is driven through the magnetic element(s), but not when the magnetic element(s) are in a quiescent state.

Applicant agrees that Fukumoto mentions the free layer being subject to stress. However, Fukumoto fails to describe the recited stress-assist layer. In some sections, Fukumoto simply indicates that the free layer is subjected to stress, but does not indicate the source of the stress. See, for example, Fukumoto, paragraphs 57 and 62. These portions of Fukumoto, therefore, do not indicate that the stress is present when the magnetic element is being written but not when the magnetic element is quiescent. Later, Fukumoto does indicate that the oxide layers on Fukumoto can be a source of stress and, therefore, that their thicknesses should be controlled to reduce the stress on the free layer. See, for example, Fukumoto, paragraphs 120, 129, 133, 136, 147-149, and 150. However, Fukumoto states that the stress induced would be due to a distortion in the lattice of the oxide layer caused by a large thickness in of the oxide. Fukumoto, paragraph 120. There is no indication in Fukumoto that such a thickness difference and thus lattice distortion could be present when the magnetic element is written, but not when the magnetic element is quiescent. Instead, such a lattice distortion would apparently always be present for a thicker oxide layer. As a result, the resulting stress would always be present for a thicker oxide layer. Consequently, although Fukumoto

discusses stress being present on the free layer, Fukumoto fails to teach or suggest the use of stress-assist layer(s) that exert stress(es) on magnetic element(s) when the magnetic element(s) are written (using spin transfer), but not when the magnetic element(s) are in a quiescent state. Consequently, Fukumoto fails to teach or suggest the magnetic memory recited in claim 1.

Claims 3-7, 11, and 12 depend upon independent claim 1. Consequently, the arguments herein apply with full force to claims 3-7, 11, and 12. Accordingly, Applicant respectfully submits that claims 3-7, 11, and 12 are allowable over the cited references.

The Examiner also rejected claim 14 under 35 U.S.C. § 102 as being anticipated by Fukumoto. In so doing, the Examiner cited the "Description of the Related Art" and "Summary of the Invention" sections.

Applicant respectfully traverses the Examiner's rejection. Claim 14 recites a magnetic memory that includes a plurality of magnetic elements and at least one stress-assist layer. Claim 14 recites that each of the plurality of magnetic elements is configured to be written using spin transfer and that the at least one stress-assist layer is configured to exert at least one stress on at least one magnetic element of the plurality of magnetic elements during writing and not when the at least one magnetic element is in a quiescent state. Claim 14 further recites that the stress-assist layer including at least one of a piezoelectric and an electrostrictive material.

Claim 14 contains analogous limitations to claim 1. Consequently, the arguments herein apply with full force to claim 14. Accordingly, Applicant respectfully submits that claim 14 is allowable over Fukumoto.

Claim 14 further recites that the stress assist layer includes at least one of a piezoelectric and electrostrictive material. Applicant has found no mention in the cited

portions of Fukumoto of a piezoelectric or electrostrictive material. More specifically, Applicant has found no mention in Fukumoto of a piezoelectric or electrostrictive material used to exert stress(es) on magnetic element(s) during writing, but not when the magnetic element(s) are in a quiescent state. Consequently, Fukumoto fails to teach or suggest the magnetic memory recited in claim 14. Accordingly, Applicant respectfully submits that claim 14 is allowable over the cited references.

The Examiner also rejected claims 39-40 under 35 U.S.C. § 102 as being anticipated by Fukumoto. In so doing, the Examiner cited the "Description of the Related Art" and "Summary of the Invention" sections.

Applicant respectfully traverses the Examiner's rejection. Claim 39 recites a magnetic memory that includes a plurality of magnetic elements configured to be written using spin transfer. Claim 39 further recites that each of the magnetic elements includes a ferromagnetic free layer having a perpendicular anisotropy and a nonmagnetic capping layer on the ferromagnetic free layer. Claim 39 further recites that "the nonmagnetic capping layer [is for] reducing the perpendicular anisotropy of the ferromagnetic free layer."

Fukumoto fails to teach or suggest a magnetic memory including magnetic elements that are configured to be written using spin transfer in conjunction with a capping layer that reduces the perpendicular anisotropy of the free layer of the magnetic element. As discussed above, Fukumoto fails to teach or suggest the use of magnetic elements that are configured to be written using spin transfer.

Moreover, Fukumoto fails to teach or suggest a capping layer that reduces the perpendicular anisotropy of the magnetic element's free layer. As discussed previously, Fukumoto describes a magnetic element that includes a free layer that may have a

stress induced on it, for example by an oxide layer. See, for example, Fukumoto, paragraph 120. This stress induces an anisotropy in the magnetic element, but Applicant has found no indication in Fukumoto that the anisotropy is a perpendicular anisotropy. In addition, Fukumoto describes a mechanism for inducing less stress on the free layer: keeping the oxide layer thin. Fukumoto, paragraph 120. Thus, Fukumoto indicates that the oxide layer increases the stress on the free layer, but that this increase may be kept small. However, Fukumoto does not describe a mechanism for *reducing* the perpendicular anisotropy already present in the free layer. Consequently, Fukumoto fails to teach or suggest the use of a nonmagnetic capping layer that reduces the perpendicular anisotropy of the magnetic element's free layer. Accordingly, Applicant respectfully submits that claim 39 is allowable over the cited references.

Claim 40 depends upon claim 39. Consequently, the arguments herein apply with full force to claim 40. Accordingly, Applicant respectfully submits that claim 40 is allowable over the cited references.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

STRATEGIC PATENT GROUP, P.C.

February 20, 2007
Date

/Janyce R. Mitchell/ Reg. No. 40,095
Janyce R. Mitchell
Attorney for Applicant(s)
(650) 396-7522